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REMARKS

Applicants previously presented claims 1-3, 5-16, and 18-24 for examination. In the above-identified Office Action, the Examiner has rejected all of the claims. Applicants appreciate the comments provided by the Examiner in the Office Action. By this amendment, Applicants have amended claims 1, 5-8, 10, 13, 15, and 16; cancelled claim 23; and added claim 25. Accordingly, claims 1-3, 5-16, 18-22, 24 and 25 remain pending. Applicants respectfully request that the Examiner reconsider the application in light of the amendments and the remarks expressed herein.

103 Rejections regarding claim 1 and its dependent claims 2-3 and 5-15

Claim 1 and its dependent claims 2-3 and 5-15 were rejected under 35 U.S.C. 103(a) as being unpatentable as follows:

(a) claims 1-3, 5-9, and 13 over Manabe (US Pat. No. 6,556,687) in view of Takahashi et al. (US Pat. No. 6,643,377, hereinafter referred to as "Takahashi");

(b) claims 10 and 12 over Manabe in view of Takahashi in further view of Wiser et al. (US Pub. No. 2003/0009248 A1, hereinafter "Wiser");

(c) claim 11 over Manabe in view of Takahashi in further view of Wiser and Brain (Brain; Marshall, How USB Ports Work, October 11, 2002, www.howstuffworks.com/usb);

(d) claims 13 and 14 over Manabe in view of Takahashi in further view of Fosgate et al. (US Pat. No. 5,666,424, hereinafter "Fosgate"); and

(e) claim 15 over Manabe in view of Takahashi in further view of Tanaka et al. (US Pat. No. 4,823,908, hereinafter "Tanaka").

Applicants respectfully disagree with the rejections.

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All of the 103(a) rejections are based on combining Manabe with one or more other references. Initially, it is submitted that there is no motivation to combine any of these references in the manner that the Office Action proposes.

Regarding claim 1, it was rejected based on Manabe in view of Takahashi.

First of all, Takahashi does not teach or suggest its apparatus having a beam-attribute control unit that can control a width of the ultrasonic output of a directional speaker so that the beam width of the ultrasonic output can be changed.

As to Manabe, it pertains to a super-directional loudspeaker, which "makes for a listener to receive an audible sound at a high sound pressure with a compact size." The speaker includes a supporting member with "electro-acoustic transducer elements fixed to the supporting member." "The elements are arranged ... in such a way that the directional ultrasonic waves emitted by the elements propagate in the air to converge on a listening point in front of the concave surface."¹

As shown in FIG. 4 of Manabe, the ultrasonic waves "emitted from all the elements 41 propagate in the air to converge on the point P."² "A listening area A exists around the listening point P, as shown in FIG. 4. If the listener is located in the listening area A, he can listen to the demodulated audible sound at a comparatively high sound pressure which is lower than the maximum sound pressure."³

The "location of the listening point P is readily adjustable according to the location change of the listener."⁴ As shown in its FIG. 7, "the listener is initially located at the position P1", and he moves "to the position P2".⁵ A distance calculator 63 outputs an electric control signal S6 to the curvature controller 70 to change the curvature of the transducer unit 40 to cover the listener position P2.⁶

¹ The abstract in Manabe, with emphasis added.

² Col. 7, lines 26-28 of Manabe, with emphasis added.

³ Col. 8, lines 18-23 of Manabe.

⁴ Col. 10, lines 26-28 of Manabe.

⁵ Col. 9, lines 61-65 of Manabe.

⁶ Col. 10, lines 6-11 of Manabe.

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Manabe teaches changing the listening point P by mechanical mechanisms. "The supporting member 42 may be formed by sector-shaped blades 43 that are movable around its center O. The blades are moved like an aperture shutter of a camera by the curvature controller 70 to change the curvature of the concave surface as necessary, thereby keeping an obtainable sound pressure at the listening point P maximum."⁷

No teaching or suggestion of a beam-attribute control unit that is configured to change the beam width of an ultrasonic speaker

The Office Action argued that Manabe taught changing the curvature of the supporting member 42, which influences the width of the beam as shown in its Fig. 7. Even if the Office Action is correct, Manabe does not teach or suggest a beam-attribute control unit that is configured to change the beam width of an ultrasonic output of a directional speaker. FIG. 7 of Manabe teaches a mechanism that changes the listening point P from P1 to P2. The "listener is initially located at the position P1", and he moves "to the position P2".⁸ A distance calculator 63 outputs an electric control signal S6 to the curvature controller 70 to change the curvature of the transducer unit 40 to cover the listener position P2.⁹ In other words, Manabe teaches changing the focal-point position of its transducer unit 40 by changing the curvature of the unit 40.

There is no teaching or suggestion in Manabe of a beam-attribute control unit that is configured to change the beam width of an ultrasonic speaker, which is specifically recited in Applicants' claim 1. Nor is there such teaching or suggestion in Takahashi.

No teaching or suggestion of a beam-attribute control unit that is configured to change the beam width of an ultrasonic speaker through electronic, not mechanical, mechanisms

Both Manabe and Takahashi do not teach or suggest a beam-attribute control unit that is configured to change the beam width of an ultrasonic output of

⁷ Col. 10, lines 18-24 of Manabe.

⁸ Col. 9, lines 61-65 of Manabe.

⁹ Col. 10, lines 6-11 of Manabe.

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a directional speaker, let alone a beam-attribute control unit that is configured to change the beam width of an audio output of a directional speaker through electronic, not mechanical, mechanisms.

The Office Action argued that Manabe taught changing the curvature of the supporting member 42, which influences the width of the beam as shown in its Fig. 7. Even if that is true, Manabe at least teaches a mechanical mechanism "like an aperture shutter of a camera ..."¹⁰ The curvature of the transducer unit 40 can be changed via the mechanical mechanism, which in turn changes the focal-point position of the unit. In other words, the changing of the listening point P in Manabe is through mechanical mechanisms.

To further distinguish from Manabe, Applicants include in claim 1 the limitations of a beam-attribute control unit being configured to change the beam width of an audio output of a directional speaker through electronic, not mechanical, mechanisms. Not only are such limitations not taught or suggested by Manabe and Takahashi, they are opposite from what Manabe teaches. Thus, Manabe not only does not teach or suggest Applicants' invention under claim 1, but Manabe also teaches away from Applicants' claimed invention.

Based on the foregoing, it is submitted that the claim 1 is patentably distinct from Manabe and Takahashi. In addition, it is submitted that its dependent claims are also patentably distinct for at least the same reasons. Further independent claim 1 or its dependent claims recite additional elements which when taken in the context of the claimed invention further patentably distinguish the art of record. A number of examples are discussed below.

For example, the Office Action rejected claim 6 based on the argument that Manabe teaches using a position signal of the position of a listener to control the curvature of the transducer unit 40. Applicants respectfully disagree because there is no teaching or suggestion in Manabe of a remote controller, let alone a beam-attribute control unit being configured to electronically control an attribute

¹⁰ Col. 10, line 21 of Manabe.

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of the output of a directional speaker, and the attribute controlled depending on the remote controller.

As another example, the Office Action rejected claim 13 based on Takahashi's commander modifying audio signals by rotating the position of its speakers as shown in its FIG. 6. Applicants respectfully disagree with the rejection. Takahashi's FIG. 6 shows a commander transmitting a rotation command to rotate two speakers by an operation of a listener. However, there is no teaching or suggestion in Takahashi's FIG. 6 of (a) an environmental adjustment unit modifying the audio signals or the ultrasonic signals, and (b) the modifying according to a piece of information from the environment in the vicinity of a portable device used by a user.

Thus, it is respectfully requested that the Examiner withdraw the rejection of claim 1 and its dependent claims 2-3 and 5-15 under 35 USC §103(a).

103 Rejections regarding claim 16 and its dependent claims 18-22 and 24

Claim 16 and its dependent claims 18-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe in view of Tanaka and further in view of Fosgate. Applicants respectfully disagree with the rejections.

No motivation to combine Tanaka, Manabe and Fosgate

As explained above, Manabe pertains to a super-directional loudspeaker of compact size to generate an high-sound-pressure audible sound using ultrasonic wave¹¹. Tanaka pertains to a parametric loudspeaker that safeguards its listeners from ultrasonic wave while providing an acoustic filter to permit the passage of only the audio frequency to listeners. "[T]his invention is effective to intercept the powerful ultrasonic wave radiated from the ultrasonic wave radiator thereby to safeguard the listeners."¹² In other words, Manabe pertains to generating high-sound pressure, while Tanaka pertains to intercepting the powerful ultrasonic wave to safeguard the listeners. The two references seem to

¹¹ The abstract of Manabe.

¹² Col. 15, lines 14-17 of Tanaka.

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point towards opposite directions, one for power and the other for protection against power.

Fosgate pertains to a surround sound system using multichannel redistribution of sound by several loudspeakers surrounding a listener.¹³ Fosgate's speaker does not even use ultrasonic waves.

Based on the above discussion regarding the three references, it is unclear why and how one of ordinary skill in the art would be motivated to combine the three references in the manner as proposed in the Office Action.

No teaching or suggestions of increasing the ultrasonic frequency to increase the beam width of the directionally constrained audio

Not only that the cited references should not be combined as suggested, there is also no teaching or suggestion in Manabe, Fosgate and Tanaka, singly or in any combination, of increasing the ultrasonic frequency to increase the beam width of the directionally constrained audio, as recited in claim 16.

Hence it is submitted that Manabe, Fosgate and Tanaka alone or in any combination do not teach or suggest claim 16, or its dependent claims 18-22 and 24.

Based on the foregoing, it is submitted that the claims 1-3, 5-16, 18-22 and 24 are patentably distinct from all the cited references. Further the independent or the dependent claims recite additional elements which when taken in the context of the claimed invention further patentably distinguish the art of record. The additional limitations recited in the independent claims or the dependent claims are not further discussed as the above-discussed limitations are clearly sufficient to distinguish the claimed invention from the cited references. Thus, it is respectfully requested that the Examiner withdraw the rejection of claims 1-3, 5-16, 18-22 and 24 under 35 USC §103(a).

¹³ The abstract in Fosgate.

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Summary

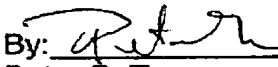
It is submitted that claims 1-3, 5-16, 18-22, 24 and 25 are patentably distinct from the cited references. Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

In the event that the Examiner, upon reconsideration, determines that an action other than an allowance is appropriate, the Examiner is requested and authorized to telephone Applicants' representative below prior to taking such action, if the Examiner feels that such a telephone call will advance the prosecution of the present application.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned representative at the telephone number listed below.

Respectfully submitted,

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